Climate Change and Human Health Literature Portal

National Institute of
Environmental Health Sciences

Cardio-respiratory outcomes associated with exposure to wildfire smoke are modified by measures of community health

Author(s):	Rappold AG, Cascio WE, Kilaru VJ, Stone SL, Neas LM, Devlin RB, Diaz-Sanchez D
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Abstract:

Background: Characterizing factors which determine susceptibility to air pollution is an important step in understanding the distribution of risk in a population and is critical for setting appropriate policies. We evaluate general and specific measures of community health as modifiers of risk for asthma and congestive heart failure following an episode of acute exposure to wildfire smoke. Methods. A population-based study of emergency department visits and daily concentrations of fine particulate matter during a wildfire in North Carolina was performed. Determinants of community health defined by County Health Rankings were evaluated as modifiers of the relative risk. A total of 40 mostly rural counties were included in the study. These rankings measure factors influencing health: health behaviors, access and quality of clinical care, social and economic factors, and physical environment, as well as, the outcomes of health: premature mortality and morbidity. Pollutant concentrations were obtained from a mathematically modeled smoke forecasting system. Estimates of relative risk for emergency department visits were based on Poisson mixed effects regression models applied to daily visit counts. Results: For asthma, the strongest association was observed at lag day 0 with excess relative risk of 66%(28,117). For congestive heart failure the excess relative risk was 42%(5,93). The largest difference in risk was observed after stratifying on the basis of Socio-Economic Factors. Difference in risk between bottom and top ranked counties by Socio-Economic Factors was 85% and 124% for asthma and congestive heart failure respectively. Conclusions: The results indicate that Socio-Economic Factors should be considered as modifying risk factors in air pollution studies and be evaluated in the assessment of air pollution impacts.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3506568

Resource Description

Exposure : ⊠

weather or climate related pathway by which climate change affects health

 Air Pollution, Extreme Weather Event

   Air Pollution: Particulate Matter

   Extreme Weather Event: Wildfires

Geographic Feature: ⊠

resource focuses on specific type of geography

 Rural

Geographic Location: ☒

resource focuses on specific location

 United States

Health Impact: ☒

specification of health effect or disease related to climate change exposure

 Cardiovascular Effect, Morbidity/Mortality, Respiratory Effect

   Cardiovascular Effect: Other Cardiovascular Effect

     Cardiovascular Disease (other): congestive heart failure

   Respiratory Effect: Asthma

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

 Adaptation

Population of Concern: A focus of content

Population of Concern: ☒

populations at particular risk or vulnerability to climate change impacts

 Low Socioeconomic Status

Resource Type: ☒

format or standard characteristic of resource

 Research Article

Timescale: ☒

time period studied

 Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

 A focus of content